ENERGY SOLUTIONS FOR A LIVABLE COMMUNITY

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Environmental and Energy Study Institute

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In recent months, the nation's attention has been drawn to the "energy crisis" in California and spreading throughout the Northwest. In addition, high energy prices have affected regions throughout the nation. While discussion has focused on price caps, supply issues, and electric utilities, solutions that affect energy demand play an important role in addressing these problems. A briefing co-sponsored by the House Livable Communities Task Force, the House Renewable Energy and Energy Efficiency Caucus, and Smart Growth America examined how improved land use and building design could protect our nation's energy supplies and enhance community livability.

THE ENERGY AND SMART GROWTH CONNECTION

"A confluence of issues are causing current energy problems," asserted Congressman Earl Blumenauer (D-OR), chair of the House Livable Communities Task Force, who opened the proceeding. The United States uses twice as much energy per capita as do other industrialized nations and six times as much energy as developing countries. The average American consumes five times as much energy for transportation as does the average Japanese. Creating livable communities means examining how we develop land, how we build buildings, and how we move people – and ensuring these encourages a sustainable use of energy. "Energy is at the very heart of the debate on sustainability and quality of life," added Congressman Mark Udall (D-CO), the session's moderator. National security, job creation, air quality, and how we lead our daily lives revolve around good energy choices. Sustainability means choosing a diversified energy system. "Smart growth is a useful framework for looking at energy policy," added Kate Bicknell, policy director for Smart Growth America.

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PANELISTS

Rep. Earl Blumenauer (D-OR)
Chair, House Livable Communities Task Force

Kate Bicknell
Policy Director, Smart Growth America

Rep. Mark Udall (D-CO)
Co-chair, House Renewable Energy and Energy Efficiency Caucus

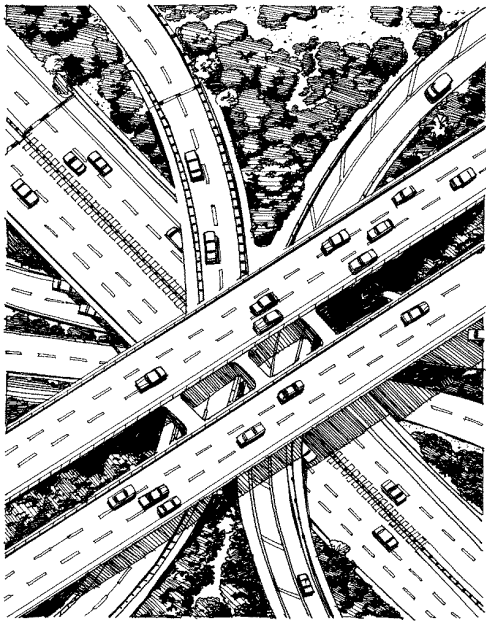
Dr. Joseph Romm
Executive Director, Center for Energy and Climate Solutions; former Acting Assistant Secretary, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy

Kaid Benfield
Director of Smart Growth, Energy and Transportation Programs, Natural Resources Defense Council

Jason Jordan
Government Affairs Manager, American Planning Association

Deane Evans
FAIA, *The Evans Group and Vice Chair of the Sustainable Buildings Industry Council*

TRANSPORTATION, ENERGY AND SMART GROWTH



The United States is developing land at a rate of three million acres per year. Land development, explained Kaid Benfield, director of Smart Growth, Energy and Transportation programs at the Natural Resources Defense Council, is far outpacing population growth. And as our destinations have grown further apart, we are driving more and for longer distances.

Over the past few decades, traffic has grown three times faster than population. Since 1970, total vehicle miles traveled (VMT) has more than doubled, according to an U.S. Department of Transportation study referenced by Benfield. The long-term pattern of growth in VMT is an average of 2 percent per year. Our transportation energy consumption rate similarly is increasing by about 2 percent per year.

A substantial portion of the increase in driving and associated energy consumption is due to our land use patterns. Spread out patterns of development affect energy demand, as well as increase air pollution. Transportation sources emit 32 percent of U.S. carbon dioxide emissions from fossil fuels. To increase the energy efficiency of transportation, suggested Benfield, we need to address the transportation of freight, in addition to the transportation of people, as freight transport is the fastest growing component of the overall transportation sector and a significant energy user.

While shifting demographics, such as the increase of female participation in the workplace, have contributed to additional cars on the road, land-use factors account for over 60 percent of the growth in automobile travel, according to a U.S. Department of Transportation study referenced by Benfield. Changes in the way we develop land have led to an increase in the number of car trips made, as well as the average trip distance. From 1983 to 1995, for example, the average length of work trips increased by 36 percent, reflecting that jobs and housing have become increasingly isolated from each other. Another study found that 30 to 40 percent of morning traffic in Wake County, NC, consisted of parents taking their children to school. In fact, the energy used to take children to school, if extrapolated to the whole state, was 2 to 3 times the energy used in the school buildings. Land-use planning, transportation, and energy policy need to be better coordinated.

Several studies support the fact that as neighborhoods become more compact and walkable, people will drive less. Places with a mix of land uses, retail services located within walking distance of residence, and access to transit have fewer vehicle trips compared with other neighborhoods. The Land Use, Transportation, and Air Quality Connection (LUTRAQ) project conducted in Congressman Blumenauer's district supported these findings. Another study indicated that residents who moved to a smart growth development in Sacramento, CA, drove less than they did in previous locations. An analysis of trip data in the San Francisco Bay Area indicated that automobile usage per household was about one-third higher in suburban locations than in compact neighborhoods. The EPA Atlantic Steel Project concluded that siting the Atlanta Station development in Atlanta, Georgia would lead to 62 percent less carbon dioxide emissions than a sprawl development.

Numerous communities and states are adopting smart growth programs that expand transportation choice, reduce vehicle miles traveled and associated energy usage, and improve quality of life. Smart growth programs, such as Fannie Mae's Location Efficient Mortgages that encourage individuals to live near public transit and reduce automobile travel, can solve multiple problems. An analysis conducted by the Natural Resources Defense Council indicated that if we were to devote all of our future growth to smart growth patterns, in 10 years we could achieve eight percent of the reductions we need to meet the global warming reduction targets of the Kyoto Protocol. The annual savings would grow with every new year of housing and the total benefits of smart growth would pay off long into the future.

ENERGY AND URBAN DEVELOPMENT

"Everyone is focused on energy issues but few agree on how to solve the problem," stated Dr. Joseph Romm, executive director of the Center for Energy and Climate Solutions. There are a myriad of solutions to our nation's energy problems, and many of these concern how we are developing our cities.

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Heat Islands

The average city is five to seven degrees hotter than the surrounding area. When trees and greenery are replaced with asphalt, urban heat islands are created that demand greater energy usage. The hottest times of the day coincide with peak power hours. Higher temperatures also stimulate the chemical reactions that form from nitrogen oxide and volatile organic compounds emissions. According to Romm, the best strategy for saving energy and reducing smog in most major cities is planting trees and using light colored roofs and pavements. A light colored roof and shade tree can cut home air conditioning bills by 30 to 50 percent.

Some cities such as Los Angeles and Houston are pursuing heat mitigation/cool city strategies. Los Angeles has incentives for using light colored roofs. With a variety of heat mitigation measures, Los Angeles could save $100 million per year in reduced energy bills, another $70 million in indirect savings from cooling effects, and about $360 million in reduced health costs from improved air quality. Heat mitigation strategies and incentives could be integrated in local, state and federal smart growth and energy solutions. For example, in the reauthorization of the Transportation Equity Act of the 21st Century, there are opportunities to encourage lighter materials in road construction (which can also have a longer lifespan), adjust highway widths, as well as provide incentives for planting street trees.

LAND-USE PLANNING AND ENERGY DEMAND AND SUPPLY

Jason Jordan, government affairs manager for the American Planning Association, described how improved land-use planning is essential for dealing with both ends of the energy issue – production and consumption. There are many community-based planning initiatives addressing these issues and Congress could help advance such measures on a larger scale.

Energy Production

Guaranteeing an efficient energy supply depends not only on obtaining raw materials, but also on the efficiency of production, distribution and delivery. In 1997, Illinois deregulated their electric utility industry, but neglected to plan for the siting of new power plants. Businesses' efforts to locate new plants were thwarted by residents who believed these were conflicting with local land-use priorities.

According to Jordan, eight states have Developments of Regional Impacts (DRI) that have an energy component. These agreements allow states to evaluate local land-use decisions in terms of broader, regional objectives that can help ensure energy production capabilities. Establishment of a state energy commission, an independent body appointed by the executive or legislative branch, also can work to coordinate the location of power generation and distribution facilities. These provide for a public participation process and allow the state to balance environmental concerns and energy production needs, explained Jordan. Requisite approvals also can include requirements for open space preservation in order to mitigate the impact of facilities.

Energy Conservation and Community Design

Land-use patterns have a direct effect on energy usage, stated Jordan. Suburban households require 40 percent more energy than do urban households. The average urban family uses 120 million BTUs less than suburban families and emits 15 tons less carbon dioxide.

Creating more compact and denser communities makes a significant difference for energy usage. Annual energy costs per unit for a 3-units per acre development are $4,800. If you increase density to 12 units per acre, costs per household drop to $4,300 or less. The U.S. Department of Energy determined that with a more efficient design and the use of energy efficient technologies, 30 percent, or $100 billion per year in energy costs, could be saved in the 25 million new housing units and 17 billion square feet of commercial development our country will build over the next 15 years. Without such measures, annual energy usage in these buildings will be equal to the energy used by the states of Virginia and Ohio, combined.

Public participation is important for encouraging improved land-use planning that will lead to the more efficient use of energy. The federal government could help supply data to the public about the energy costs associated with different development patterns, Jordan explained. Incentives for change should also be provided to individuals making good energy choices. Conservation benefits ripple throughout the community. In fact, the proposed Community Character Act (H.R. 1433), introduced by Representative Blumenauer (D-OR) and Representative Wayne Gilchrest (R-MD), would authorize $50 million in federal grants to states for better planning.

HIGH PERFORMANCE BUILDINGS AND LIVABLE COMMUNITIES

Smart building design leads to reduced energy usage and other quality of life improvements, explained Deane Evans, vice chair of the Sustainable Buildings Industry Council. Buildings currently use one-third of all energy in the United States and generate 35 percent of the nation's greenhouse gas emissions. There is tremendous opportunity to take advantage of alternative technologies and improved building design, stated Evans. Buildings that are redesigned or retrofitted could reduce its energy usage by 30 to 50 percent. In the future, we could achieve efficiencies of up to 75 percent. Retrofitting buildings decreases energy demand and can be accomplished at a far faster rate than increasing energy supply by bringing a new power plant on line. And, high performance buildings do not have to cost more than other buildings, noted Evans.

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While there is much opportunity to improve energy efficiency in the building industry, this industry is very disaggregated and slow to change. The federal government helped to promote innovation in this area and has provided valuable historical information as well as computer analysis to optimize energy usage in buildings. Their continued leadership in this area, in the form of additional research and incentives, would make a tremendous difference for advancing this issue. The building industry is 13 percent of our gross domestic product.

Many states and communities are examining opportunities to reduce energy usage in schools through improvements in energy efficiency and the use of day lighting and other renewable energy sources. Clark County, Nevada, for example, is looking at developing a "zero energy" school. Not only will school districts save energy and money, providing more money for real education, but the students perform better. One study in California demonstrated that using controlled day lighting as an alternative to artificial lighting improved students' performance in math and reading. High performance buildings are better buildings and improve quality of life, stated Evans.

SUMMARY

Panelists concluded that there were numerous solutions to our energy problems that also improve community livability. In many cases, such solutions were low-tech and/or used already available technologies. Strategies that focus on smart land-use patterns, better neighborhood and building design, and expanded transportation choices are well within our reach and at the core of an effective energy policy that also provides multiple benefits.

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